USE AND EFFECTIVENESS OF CONTRACT SCHEDULE INCENTIVES IN AIR FORCE MATERIEL COMMAND

THESIS

Rodrick A. Koch, Captain, USAF

AFIT/GRD/ENV/06J-02

DEPARTMENT OF THE AIR FORCE
AIR UNIVERSITY

AIR FORCE INSTITUTE OF TECHNOLOGY

Wright-Patterson Air Force Base, Ohio

AFIT/GRD/ENV/06J-02

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THESIS

Presented to the Faculty

Department of Systems and Engineering Management

Graduate School of Engineering and Management

Air Force Institute of Technology

Air University

Air Education and Training Command

In Partial Fulfillment of the Requirements for the

Degree of Master of Science in Research and Development Management

Rodrick A. Koch, BS

Captain, USAF

June 2006

AFIT/GRD/ENV/06J-02

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Rodrick A. Koch, BS
Captain, USAF

Approved:

/signed/	7 June 2006
Dennis D. Strouble (Chairman)	date
/signed/	7 June 2006
Jeffrey S. Smith (Member)	date
/signed/	7 June 2006
Ross T. McNutt (Member)	date

AFIT/GRD/ENV/06J-02

Abstract

Are contract schedule incentives utilized by our acquisition contracting workforce, and if so what are their effectiveness? This research shows there is not widespread use of these types of incentives. There is also disagreement on their perceived effectiveness. Surveying, via email, the population of contracting officers and buyers within Air Force Materiel Command yielded responses from every center and many large acquisition systems. Only 8.5% of responses showed that they use schedule incentives. These respondents claim that schedule incentives are somewhat effective, yet of the 91.5% that have not used them, 2-to-1 say they would not be effective. The population named a number of roadblocks as well as a number of documents providing guidance for their implementation. Common incentive and award-fees, though not by definition schedule incentives, were perceived to shorten schedule length. By analyzing the responses as a whole, there seems to be a general lack of understanding concerning the definition, use, and implementation of schedule incentives within this population. The conclusion points to the need for education on the topic of schedule incentives.

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I. Introduction

Background

Within the commercial world practices are emerging that improve cost, schedule, and performance parameters of contracts. These practices come from different movements such as Lean, Business Process Reengineering, and Cycle Time Reduction. The core of these movements is the reduction of the amount of time a product is in development, production, and delivery. These movements suggest that if an organization focuses on reducing a product's schedule (reducing waste) the cost and performance of the product will not decrease, but improve. It is contrary to many conventional methods that focus on cost reduction or performance enhancements individually.

Cycle time reduction has many facets of implementation, which range from reducing employee's movements to using contract and management incentives to increase performance during development stages. The intricacies of cycle time reduction implementation are far too complex to explain in this paper. Specifically the focus of this paper is to understand the use and effectiveness of schedule incentives within the Air Force acquisition system.

The Air Force has a history of implementing commercial practices within the acquisition system. The results of these efforts are inconclusive. For the sake of

improving the value to the taxpayer, the application of new successful commercial practices within the Air Force acquisition system must be considered.

Problem Statement

Incentives are defined as awards or bonuses that serve to induce or motivate a particular performance. Incentives, in the Air Force acquisition realm, are used to acquire more performance from a contract for marginally more money. Incentives can also reduce the overall cost of a program or contract by providing an incentive for meeting a program target cost.

Incentives can also be used to improve schedule performance. Schedule incentives are defined as bonuses or awards that are distributed based on early delivery of a contracted product or service. Though not widely used in the Air Force (McNutt, 1998:245) schedule incentives may be a vehicle to improve contract performance. The focus of this research is to determine the current usage and effectiveness of contract schedule incentives.

In the larger body of research, this thesis will update the previous work accomplished by Lieutenant Colonel Ross McNutt. It will reveal the current usage of incentives by surveying the Air Force Materiel Command (AFMC) contracting professional population. By surveying this population, the large majority of Air Force acquisition contracts will be assessed. This research will reveal the value of schedule incentives to Air Force acquisition programs and provide guidance for future implementation of schedule incentives.

Research Questions

There are many questions that surround the use of schedule incentives. Primarily this thesis focuses on the following questions:

- Are there contracts within the Air Force acquisition system that use schedule incentives?
- What roadblocks, if any, exist in the implementation of schedule incentives?
- What is the perception, among contract officers, of the use and effectiveness of contract incentives?
- Do other forms (incentive-fee or award-fee) of incentives positively affect the schedule of a contract?

Assumption

The use of incentives within the Air Force acquisition system is not a new practice. The current acquisition system uses contract incentives to improve contractor performance. These incentives usually take the form of an award or incentive fee. Award fees are distributed based on multiple factors such as cost, schedule, and performance of the system. Contract incentives have become an important part of our acquisition system.

Though the use of contract incentives is pervasive within the Air Force, there is an important distinction that must be made. Though award fee and incentive fee contracts may include schedule performance as one of the deciding factors for awarding a fee, most cannot be defined as a schedule incentive. The strict definition of a schedule

incentive must not include typical broad award fee contracts unless those fees are written to be awarded strictly based on schedule performance. This research looks exclusively at schedule incentive use and effectiveness as apposed to broad contract incentives.

Way Ahead

This research will give the acquisition community an idea of the use of schedule incentives. It provides a unique opportunity to sample the entire population of contract professionals and obtain a clear view of the advantages or disadvantages that schedule incentives bring to the acquisition program. The next few chapters will outline the foundation of this research and describe the methods that will be used to get quality results.

II. Literature Review

Rapid Product Development Background

The commercial world is a very competitive environment. Companies survive based on their advantages in their competitive market. Rapid product development has shown that it brings many advantages to the companies that employ its techniques. What are the advantages of rapid product development?

Basics

Rapid product development is the process of decreasing the time it takes to design, develop, and produce a product. It is also referred as "cycle time reduction." The main tenets of cycle time reduction is reducing wasteful processes, creating cross functional product teams, understanding the needs of the customer, and strategic planning.

Companies that have focused on reducing product development cycles have reaped large benefits to their bottom line. Companies like Toyota, Honda, Boeing and Hughes Aircraft (McNutt, 1998:65) are able to bring products to market more quickly than their competitors. They are also able to respond to the needs of the customer more quickly. Cycle time reduction allows companies to bring more products to the marketplace.

These benefits allow a company to start a project later than its competitors and bring it to market at the same time with more technology. This enables the rapidly developed product to have the latest needs of the consumer included in its specifications.

Longer development cycles are less able to respond to the changing needs of customers. Therefore, reducing a company's product development cycle affects all aspects of the operation and the company's ability to create competitive products.

DOD and Cycle Time Reduction

Companies who rely on profits for their existence receive the most benefits of cycle time reduction. What are the benefits to cycle time reduction within the government? What is the opinion of senior leaders in the DOD?

Product development cycle or "acquisition cycle" is defined as the time it takes the government to respond to an operational need (from recognized deficiency to produced system). Development time is the time it takes from first decision to build a system to first produced system. The DOD development time for large systems has been increasing (McNutt, 1998:35) steadily since the 1980s. The average development time in the 1980s for major defense products was 97 months. The average time is currently well above 120 months (Dept of the Army, 2001:146).

The 1986 President's Blue Ribbon Commission on Defense Management also known as "The Packard Commission" stated, "In frustration, many have come to accept the ten-to-fifteen-year acquisition cycle as normal, or even inevitable. We believe that it is possible to cut this cycle in half." The commission also reported, "… a much more serious result of this management environment is an unreasonably long acquisition cycle -ten to fifteen years for our major weapons systems. This is a central problem from which most other acquisition problems stem…" The report goes on to list the other problems that result from poor management and long acquisition cycles. Those problems

include unnecessarily high development costs, obsolete technology in products, and goldplating based on overly conservative threat estimation.

More recent examples of senior leadership's thoughts on acquisition cycle times show continuing concern for this problem. In a 2000 visit to Hanscom Air Force Base, Dr. Marvin Sambur, Assistant Secretary of Air Force said, " the status quo is unacceptable because acquisition cycle times are much too long." (Paone, 2003:1)

Cycle Time Reduction Methods

There are many suggestions and methods available that reduce product development time. The Packard Commission suggested many items which attempted to reduce the time it takes the government to acquire systems. Unfortunately, the system is still suffering from many of the same problems despite these efforts.

What are the techniques that have worked in industry? Are some of these techniques available for use within the DOD? These questions have been at the core of much of the research within the Massachusetts Institute of Technology (MIT) LEAN Aerospace Initiative. Lieutenant Colonel Ross McNutt has captured much of this research in his dissertation "Reducing DOD Product Development Time: The Role of the Schedule Development Process."

One of the foci of the cycle time reduction method presented by the MIT initiative is to bring attention to project and contract schedule issues. Research on commercial programs has revealed that once schedule concerns are identified and addressed, many of the other problems with the program's cost and performance are revealed and even solved. This is a very simple description of a process and model that is complex to

implement. The following paragraphs will outline the research supporting this method. It will clarify the role that schedule incentives play in the larger cycle time reduction field.

Lt. Col Ross McNutt outlined a framework for implementation of commercial cycle time reduction techniques in the government environment. That framework is built on the following foci (McNutt, 1998: 318):

- Provide clear leadership on reducing development cycle time
- Develop and use rigorous schedule-based information and tools
- Provide incentives that encourage shorter cycle times
- Mitigate funding-based schedule limitations
- Show results through near-term demonstration projects

Using incentives that encourage contractors to reduce there delivery time is a primary focus of schedule-based cycle time reduction research. Lt. Col McNutt's research revealed little to no use of schedule incentives.

Schedule Incentives Research

Incentive fees play a large role within Air Force contracting. Twenty percent of the money distributed on contracts over 25 thousand dollars goes towards award and incentive fee contracts (GAO, 2006:6). The use and misuse of these fees are an important part of the DOD and Air Force acquisition system.

There have been numerous studies on the reasons for increased schedule length. This literature review focuses on the field of schedule incentives. There has been little research on addressing the effects that schedule incentives have on the development time.

Government Accountability Office Contract Fee Distribution Report

A Government Accountability Office (GAO) report from April 5, 2006 reports that incentive fees are distributed without assurance that the contractor is meeting criteria for the fee. According to the report, an estimated $8 billion dollars have been distributed in award fees for the contracts in the study. These fees were distributed "…regardless of whether acquisition outcomes fell short of, met, or exceeded DOD's expectations."

According to the report (GAO, 2006:10), fees are not typically distributed based on acquisition outcomes. They are typically distributed based on broad aspects (technical performance, management performance, cost controls) of contractor performance, not acquisition performance. This means that a contractor can implement an internal program that is deemed worthy of a fee without improving or even meeting bottom line cost, schedule, and performance parameters of the contract. The results show that a contractor can be given an award fee without improving acquisition criteria. This report reveals the disconnect between acquisition performance and fee implementation.

Multiple Incentive Contracts: An Analytical Technique

In 1968, Mr. William Farmer developed an analytical economic method to characterize the effects of different types of incentives on the cost and performance of a multiple incentive fee contract (Farmer, 1968:1). It is the earliest reference to the specific term "schedule incentive" that was found. It initially treats the schedule incentive as an assumed fixed value. Later in the paper, the schedule incentive is treated as a variable in

a complex model. This model is created to help the contract manager quantify cost, schedule, and performance decisions. These quantities could then be analyzed to help predict outcomes and make decisions. Unfortunately, the research has little bearing on the use of contract schedule incentives. The idea of schedule incentives is mentioned, but only as a variable in a formula. It does not treat schedule incentives as technique for contract schedule enhancement and, therefore has nothing to offer this research.

Making Contracting Work Better and Cost Less

In February 1994 the Department of Energy (DOE) released a 163 page document called "Making Contracting Work Better and Cost Less." It is a comprehensive guide for DOE contracting reform. It outlines 47 different actions designed to solve many of the problems the department has with its contract management.

Among its many suggestions for contract managers is the implementation "…of tailored incentives for Performance-Based Management Contracts" (DOE, 1994:26). Along with other topics such as cost incentives, future budget allocations, and linking contract duration and extension to performance; specialized incentives (technical performance, delivery and schedule incentives) are suggested. Schedule incentive use, according to this document, is suggested for performance-based contracts. There is no research provided to support the paper's claims concerning the improvement of performance of contracts with incentives.

Defense Acquisitions Incentives Guidebook

This document was created to help all levels in DOD acquisition understand the use and implementation of contract incentives (DAU, 2001:1). This comprehensive guide is a single publication that guides the contract manager, contracting officer, or acquisition professional through the process of building a strategy that effectively uses contract incentives. This strategy includes creating the right acquisition environment, building the business case, selecting the appropriate kinds of incentives, and maintaining the acquisition environment.

The guidebook was designed to be a one-stop shop for the acquisition professional. The guidebook looks at a broad range of contractual incentives:

- Schedule-based Incentives
- Cost-based incentives
- Performance-based Incentives
- Organization and Individual Incentives
- Terms and Conditions
- Supply-Chain Incentives

This guidebook is not based on a specific research study or paper. It does cite other examples and findings that do support the use of contract schedule incentives. Those papers are discussed below.

Army Innovation in Contractual Incentives

Schedule incentives are a very small section of the larger research area presented in this Army publication (Dept of the ARMY, 2001:63). This publication looks at the entire realm of incentives (28 different forms), both monetary and non-monetary. It is the first study that has been found to academically research the specific topic of incentives. It is also the first to gather both industry and government individuals together to discuss collaboration and incentives. The research was conducted in two phases.

Phase one included an intense literature review as well as interviews with acquisition professionals and industry representatives. The first phase developed the baseline for future research into phase two. Phase one produced a compendium of the incentives.

Phase two was a series of focus groups made up of experts from industry and acquisition professionals. These focus groups, starting with the baseline information created in phase one, discussed the influences impacting business relationships as well as the critical factors both industry and government find important while entering into a business relationship. From these focus groups and information collected in phase one, two tools were created to help foster collaboration and utilize incentives.

This work seems to be some of the broadest research. It shows that other organizations see incentives as valuable. It also gives credibility to the use of schedule incentives (called “Early delivery bonus” in the Army paper) apart from other incentive types.

Peace Shield Case Study

The Peace Shield is a program that in 1995 finished 6 months and 13 days early. This occurred (according to the article) because of government and industry collaboration, group and individual awards, and a team approach (Kausal, 1996:1). What makes this case study valuable to schedule incentives research is Peace Shield used cost and schedule incentives. More specifically the government contracting team created a 50 million dollar incentive to finish three months early. This project was assumed to take at least 54 months to complete at the low end and 116 months on the high end. Because of the use of schedule incentives as well other employee incentives and awards, the program was delivered in 47 months.

Peace shield has many good examples of how beneficial incentives can be to the bottom line of a program. Not only did the program deliver its product early, but it was under the projected cost as well. It also shows that early strategic planning and industry and government collaboration is important. Without collaboration and strategic planning, incentives could be created without finding the end that both parties desire. It is a great example of how powerful and motivating a properly executed incentive can be.

III. Methodology

Overview

Determining the use of contract schedule incentives and their effectiveness is not trivial. Because contract and negotiation complexities, the contracting officers and negotiators are the most informed individuals within the entire acquisition process concerning the use of incentives. They are required to negotiate the details of the entire contract including any and all types of incentives. They alone are required to understand these types of contract details. Program managers should know about these types of contract details, but only contract professionals must know the use of incentives. Therefore, the sample population is contracting officers and negotiators.

Contracting officers and contract negotiators is the population of interest. The population is divided by centers (ASC, AAC, ESC, AFRL, AEDC and logistic centers). The survey was distributed electronically to every contracting officer and contract negotiator via email through the contracting director in AFMC. This method was chosen because of the simplicity of electronic verses mail distribution and the short period of time required for dissemination and collection.

The assessment of the data was made using standard analysis methods. The findings of the survey can apply to the entire population because the entire population was sampled. Precautions have been taken to reduce inaccuracies, biases, and errors typically found in surveys. A description of these precautions is discussed later in this chapter.

Survey Design

This survey was designed to retrieve the answers to the research questions from the population. Because of the poor response rate typically seen by surveys, this questionnaire was designed to improve non-responses as well as negate survey biases. This was done by making the survey respondent-friendly. The intent was to increase response rate of those who would normally not respond (Dillman, 2000:81).

The survey sampled the entire AFMC contracting officer core. Surveying the entire population, rather than a smaller random size, and designing a survey that minimizes typical survey errors and mistakes should enhance the quality of the results.

Introductory Format

The survey starts out with simple instructions for filling out the survey. It also explains the importance of reading the definitions of schedule incentives in order to negate confusion. Lastly, the instructions direct the respondent how and where to send the completed survey.

The next portion of the survey is the definitions section. This section explains what definition of "schedule incentives" this research is using. It also uses examples of what are and what are not schedule incentives using standard contracting terms. There are many potential definitions that could be used by respondents. There are also many types of contract incentives that are within this field. After reading the definitions section, the respondent should have no questions concerning what definition of schedule incentive to use to answer the proceeding survey questions.

Primarily the focus of the definition section was to delineate the difference between award and incentive fee contracts. This was not clearly defined in earlier research (McNutt, 1998:245).

Other question specific instructions were spread throughout the survey where they were needed. Only information that was used throughout the entire survey was placed at the beginning. This again was used to alleviate confusion and increase response rates (Dillman, 2000:98).

A statement of protection of privacy information was included in the survey. It was suggested by Mr. Michael Grove to ensure that individuals would not feel that inappropriate information would be released or tied to their answers. This should help respondents answer questions without reservation.

Questionnaire

The next section of the survey is the questionnaire (See appendix B). The survey was drafted with the core questions in mind:

- What is the use of schedule incentives within this population and if so, are they effective?
- What are the perceptions of schedule incentive use (good or bad)?
- Are there any roadblocks to implementing schedule incentives?

Many of the questions are simple yes or no answers. Other questions are open ended. This means that the respondents were not given a set of pre-selected answers from which to choose. Open ended questions reveal the answers that are very close to the actual thoughts of the respondents. Because a respondent can provide any answer, it can make

grouping and analyzing answers from the entire population more complex. Since the answers may not fit into defined categories, the respondent's opinions and answers were deemed more important than statistical division. Post survey analysis will take place to try to group the open ended answers together.

The layout of the questions incorporates the latest research from Dillman's book on survey design. Questions are in bold or dark text while answers are in lighter text. There is a progression in size to present a repeatable flow. The question numbers use a large font and are bold. Question text is bold with a smaller font and answers are normal. This helps alleviate confusion by presenting a reading order to respondents (Dillman, 2000:106). All instructions are presented in Arial with emphasized words in bold.

Many of the questions have opportunities for respondents to clarify their answers. The survey was designed to gather information to any contract professional whether or not they use schedule incentives. It was also designed to allow for the respondent to easily voice their opinions concerning the effectiveness of schedule incentives. To aid respondents through the questions, a simple layout was formulated. After a respondent answers a question, the following question, if dependent on the previous question, is in a box (see figure 1). It is designed to allow the respondent to know what questions they need to respond to and what question they can skip. Having a layout that is intuitive and not confusing is important to having the respondent understand and correctly interpret the question (Dillman, 2000, 105).

The first question of a survey is very important. If poorly designed, the first question can turn away many potential respondents. "No single question is more crucial than the first one" (Dillman, 2000, 92). For this survey, the first question is designed as

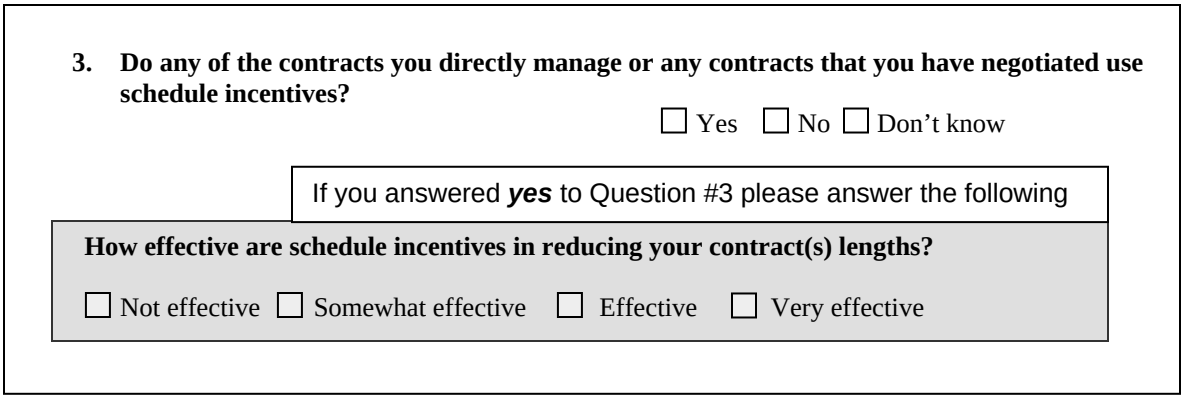

Figure 1 *Question Layout*

an introduction to the topic. It also serves a dual purpose of answering an academic curiosity. The first question asks the respondent whether they have heard of, or are aware of schedule incentives. If they have not heard about schedule incentives, it helps put their answers to the proceeding questions in perspective. If they have heard of incentives, it simple acts as an introduction to the survey material. The overall goal is not to exclude any respondents, but simply to introduce the material. It also helps ensure that the respondent understands the definition of schedule incentives. If they are unfamiliar with the term "schedule incentives" then they may be more likely to review the definitions of schedule incentives at the top of the survey before continuing.

The next question gives an understanding of the number of contracts the contracting officer oversees. The question is "How many contracts to you manage?" This is important for statistical information gathered in follow up surveys. It is one piece of information that can estimate what percentage of contracts use schedule incentives.

The third question is the start of the core questions in the survey. The question is "Do any of the contracts you directly manage or any contracts that you have negotiated use schedule incentives?" This question is looking for the contract manager's direct use

of contract schedule incentives. This question's answer updates the research completed by Lt Col Ross McNutt. The question that follows is dependent on the response to question number three. If the respondent answers "yes" to question number 3 then they are asked to answer another question. The clarifying follow up question is "How effective are schedule incentives in reducing your contract(s) lengths?" This is a subjective question that seeks to clarify the perceptions of schedule incentives of contracting officers.

Question number four seeks to understand the contracting officer's organizations use of schedule incentives. The question is "Does *your unit* use any form of schedule incentives (do not include your contracts in the answer)? " This question is seeking to find any pockets of schedule incentive use. Though the contracting officer may not use schedule incentives, they may know of someone else within their organization that does use schedule incentives. This question should acquire this information.

The follow up questions to question number four determine the perception of effectiveness of schedule incentives. There are two questions in this portion: one for those whose units use schedule incentives, and those whose units do not use schedule incentives. These answers are subjective and will clarify the perceptions surrounding schedule incentive use in units.

Question number five broadens the scope of schedule incentives outside of the unit. Question number five is answering "What is the use of schedule incentives within the contracting officer population?" Any organizations that use schedule incentives are sought out in this survey by this question. This question also broadens the effected population if there is a lower response rate. Lastly this question can also be clarified by

follow up questions. The respondent could be contacted to find out specific information about other organizations use of schedule incentives.

The sixth question is simply designed to continue to clarify the environment with which schedule incentives are used. The question is "Are there any roadblocks to implementing schedule incentives?" It looks for other hindrances that contracting officers may encounter in trying to implement these types of incentives. If the respondent answers "yes" to the question, then they have an opportunity to designate what those hindrances are in an open ended format.

Question number seven seeks to find out what contract managers know about instructions and guidance concerning the implementation of schedule incentives. Question seven is "Are you aware of any guidance for implementing schedule incentives?" It again has a follow-up clarifying question, for those who answered "yes", that asks the respondent to list guidance that discusses schedule incentive implementation. This question will add more depth and understanding to the contracting officer's environment of schedule incentive implementation.

The last research question, number eight, asks "Do incentive fee or award fee contracts provide incentives for early completion?" This question clarifies the contracting professional's perception of award fee and incentive fee contracts. More specifically, is describes what incentives, if any, these contract vehicles provide for early contract completion.

Survey Distribution

Getting a survey to every AFMC contracting officer was a large concern from the beginning of the research. The solution came with sponsorship from Mr. Thomas Wells,

Director of Contracting, AFMC/PK. The survey will be distributed via email from Mr. Wells through the various Center Directors of Contracting to the individual contract managers and negotiators. Once the surveys are complete the individual contracting officers will send their surveys, via email to Captain Koch.

To calculate survey numbers, it will important to get an accurate count of the distributed surveys. Mr. Wells's office will calculate the number of contract officers and negotiators this survey will be distributed to. These numbers are estimated by the Resource Management Division, AFMC/PKX.

Analysis Methodology

Because the entire population will be surveyed (non-probabilistic), many of the statistical tools that are normally employed in a randomly sampled survey will not be used. The results therefore will be reported as the percentage of the total population sampled.

The central goal of this research is to find where schedule incentives are being used. The questions are designed to seek out schedule incentives not only at the individual contractor level, but at the unit level. The results of questions 4 and 5 can therefore be reported as a percentage of the units represented. Question 5 may also reveal other units where schedule incentives are used. This means that a single representative will be able to report on the use of schedule incentives for their unit and others. Sampling the entire population should yield positive results even with low response rate.

Each question has a different analysis methodology. Some results will simply be reported as straight percentages while others questions, like the open ended questions,

will be more complex. Below is a discussion for how each of the question's results will be analyzed.

Multiple Response Questions

The question that is of primary importance to this research is the use, at any level, of schedule incentives. The questions that have multiple choice responses lie at the core of this research question. These questions will be reported as a percentage of the total number of responses to that particular question as well the sum of each answer. As an example; Out of the X respondents that answered the question, A answered "yes", B answered "no" and C answered "don't know".

Open-Ended Questions

Questions that do not give the respondents a prescribed set of answers can be more challenging to analyze. Multiple choice responses give the researcher clear groups and divisions with which to analyze data. Open ended questions provide no such framework; therefore, their analysis is more time consuming (Champ, 2003:82). A researcher can only hope that the received data can be organized and analyzed. For this research, the open-ended responses will be analyzed and natural groups of answers that represent all answers well will be chosen. If there are too many differing types of responses that have no defined group characteristics, then a simple listing of responses and a discussion of that listing will take place.

IV. Results

Overview

Schedule incentives are being used in Air Force Acquisitions but there are not very many instances of their use. A maximum of 2339 individuals were eligible to receive a survey. 2039 contract professionals were from acquisition organizations. It is unclear if all 2039 individuals were contacted. There were 119 responses representing at least 749 contracts represented. Of the 119 total survey responses 107 were from acquisition organizations. Ten out of the 107 said they use incentives. Of the ten, most said schedule incentives were somewhat effective in reducing schedule length.

Those that did not use schedule incentives responded with mixed concern over their use. Only 15.8% of those that answered said that schedule incentives would lessen the length of contracts, while 50% did not know. This means that 34.2% felt that schedule incentives would not be effective if used.

Ten respondents knew of other organizations that were using schedule incentives. 28 respondents answered that there were roadblocks to schedule incentive implementation and only 14 were aware of any guidance used in the implementation of schedule incentives. Lastly, 44 respondents agreed that incentive or award fees do promote early completion of contracts.

Response

Surveying the entire population of AFMC contracting officers and negotiators via email was mixed. The data were conclusive. Unfortunately the response rate was

approximately five percent assuming that 2039 individuals were contacted. This response rate also assumes that all of these individuals were contacted. The estimate of 2339 contracting professionals and 2039 acquisition contracting professionals was provided by AFMC/PK Resource Management Division. This number took into account every contracting officer or contract negotiator (civilian and military). The likelihood that every one of these officers was contacted is low due to heavy work loads and the low priority of surveys. The true response rate of those contacted could be as high as 10 and 20 percent. Using email distribution, knowing the actual number of individuals that were contacted is all but impossible. Determining the true response rate is beyond the scope of this research. Valuable data was still collected despite response rate difficulties.

35 units were represented by the population. A large number of acquisition units (28 out of the 35) were represented. ASC, ESC, AAC, AFRL, and the logistic centers all had acquisition units that were represented. This means that although the response rate was lower than preferred, the results have impact because of the cross section and diversity of respondents.

Question Results

This section summarizes the responses to each question. Any results that require analysis between questions will be addressed as necessary. Appendix C has a summary of all responses. A discussion of implications and meanings to the results are discussed in chapter five.

Question #1

Question #1 was an "ice breaking" question that determined the baseline understanding of schedule incentives. Not quite half of those that responded to question one were aware of schedule incentives. 42 percent of the respondents answered yes to question one while 55 percent answered no. The responses indicate that over half of contracting officers lack awareness of schedule incentives. Three percent of the respondents answered "Don't know". This could be due to confusion, despite a clearly outlined definition at the beginning of the survey, of the definition of contract schedule incentives.

Question #2

This question was designed to see how many contracts a contracting officer or negotiator oversees. A total of 749 contracts were listed giving an average of 6.3 per respondent. The decision, in formulating the question, was to ensure the answers from "one" to "ten or more" covered the range of answers that could be given. Unfortunately, 53 individuals answered the question with "10 or more". Therefore, it is unclear how many contracts each respondent that responded with "10 or more" really oversaw. Therefore 749 is the minimum total number of contracts this survey addresses. The response to this question will be used in proceeding analyses. Additionally, any follow up survey addressing the number of contracts managed by a contracting officer or negotiator should increase the maximum number of surveys to a higher number than 10.

Question #3

This question was the primary focus of this research. Of the 118 respondents that answered question #3, 10 answered "yes", 105 answered "no" and 3 answered "don't know". This means that 8.5% of the respondents directly manage a contract with a schedule incentive. Curiously, three individuals did not know if they managed a contract with schedule incentives. This may have been due again to a lack of understanding of the definition of schedule incentives or a lack of understanding of their contracts. Also, 2 of the 10 "yes" respondents said that they do not manage any contracts (or put zero for question #2). They are included because they may be supervisors or commanders.

Of the ten that answered yes to question #3, 7 responded with "somewhat effective" to the follow-up question. The other three answered each of remaining answers. This means that 9 out of 10 the respondents understood schedule incentives to be at least somewhat effective in reducing schedule length.

Question #4

This question sought out the use of incentives within the respondent's organization outside of his or her personal contracts. Combined with the organizations of the "yes" respondents to question 3, it should provide a list of organizations identified as using schedule incentives. Seven respondents who didn't answer yes to question #3 said that their organization did use schedule incentives. This means out of the 28 acquisition organizations represented, 11 (this included organizations that responded yes to question 3 and question 4) of those organizations have a stated contract that uses schedule

incentives. Organizations were grouped together at the two-letter level. All unit and organization analysis is approximate. Future research should focus on gathering more unit information to enhance the meaning of results.

The follow-up questions, named question #4a and #4b, were designed to determine the perceived effectiveness of schedule incentives whether or not the respondent's organization uses them or not. It was clear that these questions were either confusing, the directions were unclear, or the questions were not important to respondents. Many respondents chose to answer both questions despite the instructions stating otherwise. Yet, despite the confusion there is still good data to analyze.

Those that answered "Yes" to question #4 were to answer the follow-up question #4a. Any response from someone who did not answer yes to question #4 but did answer question #4a was removed from analysis. As well, those that answered no to question #4 were asked to answer question #4b. Any response from someone that answered yes to question #4 and answered question #4b was removed from analysis.

After removing the inappropriate answers most respondents answered "don't know" (41% for 4a and 50% for 4b). Question #4a had 3 out of the 12 responses that reported "yes" while Question #4b had 12 "yes" responses out of 76. Question #4a had 4 "no" answers out of 12 and #4b had 26 "no" answers out of 76 responses.

Question #5

This question was designed to find any other units that may be using schedule incentives. Out of the 116 respondents that answered the question, 10 answered "yes", 76 answered "no" and 30 answered "don't know". This means that 8.6% of respondents

knew of other organizations that use schedule incentives. 8 of the 10 that answered "yes" to question #5 responded to the follow up question. The organizations that were named (within or outside of the DoD) are included in the list below.

- F-16 Systems group contracting division
- Mobility Systems Wing
- SMSG/TO
- Ogden ALC
- Predator (mentioned twice)
- ESC/SR
- Department of Energy and Environmental (DOE), Management Consolidated Business Center (MCBC)

Most of the above mentioned groups were not identified in question #4. The exception is the SMSG/TO. Therefore, out of the many of two letter organizations within AFMC acquisitions, only 18 were identified, by this survey, as using schedule incentives.

Question #6

Question #6 was designed to ascertain the roadblocks that exist for schedule incentive implementation. Of the 114 respondents that answered the question, 28 answered "yes", 24 answered "no" and 62 answered "don't know".

The follow-up open-ended question asked the respondent to name any roadblocks they were familiar with. Below are the results. They have been consolidated and summarized. See appendix C for detailed responses.

- Regulations do not allow for schedule incentives

    - Strictly not allowed by regulations
    - Specific contract types do not allow schedule incentives (Firm Fixed Price, etc.)
- Government cannot support this type of contract
    - Late Government Furnished Property (GFP)
    - Too slow of a response to contractor needs
    - Not enough manpower to manage this type of complex contract
    - Not enough money to support additional incentive fees
    - Too difficult to negotiate
- Contractor's reluctance to enter into this type of contract
    - Small companies do not have resources to accelerate schedule
    - In general contractors would be reluctant to this type of incentive

Question #7

Question #7 determined the respondent's awareness of guidance for implementing schedule incentives. Of the 115 respondents that answered the question, 14 answered "yes", 78 answered "no" and 23 answered "don't know".

The follow up question asked the respondent to list what schedule incentive guidance they were aware of. Below is a list of the consolidated and summarized responses.

- Air Force and AFMC Incentive Handbook
- AFMC Award Fee Guide
- All levels of the FAR (DFAR, AFFARS AFMC FAR Supplement)

- No guidance for incentives or schedule incentives
- Expect there is guidance, but had no reason to look for it
- Lack of guidance

Question #8

This question determined if the respondent thought that incentive fee or award fees provide incentive for early contract completion. Of the 115 respondents that answered the question, 44 answered “yes”, 22 answered “no” and 49 answered “don’t know”. This means that 38.3% of those that answered this question felt incentive and award fees do help contractor’s complete contracts early. 19% did not think incentive or award fees help end schedules early.

V. Discussion

Analysis of Results

In general the survey responses do agree with expectations. Schedule incentives are not widely used by AFMC contracting professionals. 8.5% of respondents reported using incentives. This is similar to Lt. Col McNutt's finding six years ago that "Program offices report providing practically no contract-based incentives for either on time or early completion of major milestone or a project" (McNutt, 1998: 256). The apparent lack of understanding of schedule incentive use or existence is even more striking. 64% of the respondents to question #1 did not know about schedule incentives. 78% of the respondents to question #7 did not know of guidance for implementation of schedule incentives. It is clear that there is a lack of understanding of schedule incentives and their implementation. Policies and guidance like DAU Incentive Guide and successes like Piece Shield are not finding their way into every day business practices of acquisition contract professionals. This is not to say that every contract should have a schedule incentive but contract professionals should be aware of the schedule incentive as a tool. In general contracting officers and negotiators are not familiar with schedule incentives.

How many contracts were represented in this survey? Adding up the data from the surveys showed 749 contracts were managed. But, as mentioned in chapter 4, many of those that answered "10 or more" may have had many more than ten contracts. This was an oversight that could have been caught with more rigorous pre-survey population research. Any other survey that is distributed to this population should have a small focus

group of contract professionals refine the survey so this type of discrepancy does not occur again.

Schedule incentives are perceived to be somewhat effective by contracting professionals who have, or are using them. This supports the research of the LEAN initiative. Yet, of the individuals that have not used schedule incentives, the majority perception (50% answered “Don’t Know”, 34% answered “No” and 16 answered “Yes”) is they do not know if schedule incentives would be effective. This result implies that either the surveyed population has a lack of understanding and familiarity with schedule incentive implementation or their understanding of schedule incentives has been inconclusive enough to not answer yes or no. The responses from question one combined with the above information points to a general lack of understanding of schedule incentives in this population. Had the population been familiar with schedule incentive use, whether effective or not, there may have been a smaller “Don’t know” response to effectiveness questions.

Roadblocks were another research area that had important results. Those that responded to the open ended question #6 gave many areas of concern for the implementation of schedule incentives. As mentioned in chapter 4, these answers were consolidated and summarized into three main topics: regulation, government resources, and contractor reluctance. You can read the answers in appendix C and the summarized answers in chapter 4.

Many of the roadblocks mentioned do not exist and were inaccurate. One of the roadblocks mentioned was that regulation is a roadblock. Regulation does allow for schedule incentives. There is no regulation against the use of schedule incentives for most

types of contracts. Service contracts (typically at the base level) would most likely not benefit or may not even allow schedule incentives. This research does not focus on the base level service type contracts, but the larger acquisition contracts. This is one area of concern for this research. The survey was sent to a broad set of contract professionals that this research may not apply. Future research should take this into account.

Many of the roadblocks were completely accurate. Research and development contracts often do no benefit from increased schedule because developments in leading edge sciences are often hard to predict. Some contractors are going to be reluctant to sign on for schedule incentives. As well, many governmental budgets and resources are stretched to the limit making it difficult to fund additional incentives. The research from LEAN Aerospace initiative and Lt. Col McNutt's dissertation show that with the correct focus on schedule, cost and performance improve. This, as indicated by the survey responses, is a very foreign idea to many AFMC contracting professionals. This survey had a great deal of input from contract professionals that could not use or benefit from schedule incentives. Future research could look at the entire collection of AFMC contracts and create a survey addressing only the acquisition performance contracting officers, gaining a clearer perspective of what are the roadblocks to schedule incentive implementation.

Incentive fee and award fees are well known and commonly used. Question #8 looked at these types of fees and determined if they had a positive effect on schedule performance. Though "Don't know" had the highest response, respondents chose "Yes" twice as much as "no". This means that 38% of those surveyed think that common incentive and award fees enhance the schedule performance of their contracts. Future

research could also demystify this result and find out if these common awards and incentives increase schedule performance.

Final thoughts

Though the response rate was reported as 5% the true response rate is not known. The cross section response of acquisition organizations was good. There were 20 different major acquisition units represented. The results show that respondents who use incentives find them at least effective 9 to 1. The general lack of use may be due to a lack of education, as mentioned before but it could also be due to few requests from program mangers for inclusion into the contract. Future research could explain these questions with surveys of the program manger and contractor workforces.

Appendix A: Approvals

DEPARTMENT OF THE AIR FORCE
AIR FORCE MANPOWER AGENCY
RANDOLPH AIR FORCE BASE TX

11 May 2006

MEMORANDUM FOR CAPTAIN RODRICK KOCH

FROM: AFMA/MAPP
550 E Street East Suite 116
Randolph AFB TX 78150-4451

SUBJECT: Request for Survey Approval

We have reviewed your request to conduct the Air Force Contracting Officer Survey and approved its use with contracting officers within AFMC. We have assigned a Survey Control Number (SCN) of USAF SCN 06-49; valid through 31 December 2006. Please ensure that the SCN and expiration date are displayed on the survey, survey instructions and/or appropriate web sites as well as on the initial document/e-mail introducing the survey.

With regard to the survey and its associated results, it is important to draw your attention to the provisions of the Freedom of Information Act (FOIA). Under the FOIA, the public can request the results of your survey. Furthermore, if the results will be released outside the Air Force, please follow proper approval procedures through Public Affairs before the results are released.

Questions or concerns can be directed to me at DSN 487-4773. We wish you much success with your data collection effort.

//Signed//

LOUIS M. DATKO
Chief, Air Force Survey Program

DEPARTMENT OF THE AIR FORCE
AIR FORCE MATERIEL COMMAND
WRIGHT-PATTERSON AIR FORCE BASE OHIO

31 January 2006

MEMORANDUM FOR: Rodrick Koch
AFIT/ENV/GRD

FROM: AFRL/Wright Site Institutional Review Board

SUBJECT: Request for exemption from human experimentation requirements

1. Protocol title: Current Status of Incentive Implementation

2. Protocol number: F-WR-2006-0029-E

3. The above protocol has been reviewed by the AFRL Wright Site IRB and determined to be **exempt** from IRB oversight and human subject research requirements per 32 CFR 219.101(b)(2) which exempts "research involving the use of educational tests (cognitive, diagnostic, aptitude, achievement), survey procedures, interview procedures or observation of public behavior."

4. Data collection for this study can begin immediately. The IRB must be notified if there is any change to the design or procedures of the research to be conducted. Otherwise, no further action is required.

5. For questions or concerns, please contact your IRB administrator, Helen Jennings at (937) 255-0311 x232 or helen.jennings@wpafb.af.mil OR Lt. Douglas Grafel at douglas.grafel@wpafb.af.mil or (937) 255-0311 x202. All inquiries and correspondence concerning this protocol should include the protocol number and name of the primary investigator.

JEFFREY BIDINGER, Maj, USAF, MC, FS
Chair, AFRL/Wright Site IRB

Appendix B: Sample Survey

Air Force Materiel Command Contracting Officer/Negotiator Survey

Instructions:

1. Please read the definitions and questions carefully.
2. Please answer to the best of your knowledge. If you need to gather information to verify an answer, please note this so that we can do a follow up interview.
3. Type or check (depending on the question) the answer to the question.
4. "Save As" *lastname*Survey.doc and send it as an attachment to rodrick.koch@afit.edu.

Definition of *schedule incentives:* A contract or modification to a contract that rewards the contractor for improving the contract schedule performance (i.e. early delivery, early completion of significant milestones or events).

- To clarify, incentive-fee or award-fee contracts (including performance or cost parameters) are not considered "*schedule incentives*" for this research *unless* the award-fee or incentive-fee is dependent ONLY on schedule.
- Typically, incentive-fees and award-fees are tied to more parameters than just schedule performance. If any form of award-fee or incentive-fee is tied to schedule only, than this fits the definition of "*schedule incentive*".
- Contact Capt Rod Koch (937-367-9088) rodrick.koch@afit.edu or Dr. Dennis Strouble (937-255-3355 x 3323) dennis.strouble@afit.edu with any questions or clarifications.

NO personal data will be released in the report of this data.

1. Are you aware of contract incentives that relate only to schedule performance?

☐Yes ☐ No ☐Don't know

2. How many contracts do you manage?

☐1 ☐2 ☐3 ☐4 ☐5 ☐6 ☐7 ☐9 ☐10 or more

3. Do any of the contracts you directly manage or any contracts that you have negotiated use schedule incentives?

☐Yes ☐ No ☐ Don't know

If you answered ***yes*** to Question #3 please answer the following question

How effective are schedule incentives in reducing your contract(s) lengths?

☐ Not effective ☐ Somewhat effective ☐ Effective ☐ Very effective

4. Does *your unit* use any form of schedule incentives (do not include your contracts in the answer)?

☐Yes ☐ No ☐ Don't know

If you answered ***yes*** to Question #4 please answer the following question

Do schedule incentives reduce your unit's contract length?

☐ Yes ☐ No ☐ Don't know

If you answered ***no*** to Question #4 please answer the following question

Would schedule incentives reduce contract lengths if they were used in your unit?

☐ Yes ☐ No ☐ Don't know

1. Do you know of any other units that have implemented or are implementing schedule incentives?

☐ Yes ☐ No ☐ Don't know

What are the units, if any: Enter answer here

2. Are there any roadblocks to implementing schedule incentives?

☐ Yes ☐ No ☐ Don't know

Roadblock examples, if any: Enter answer here

3. Are you aware of any guidance for implementing schedule incentives?

☐ Yes ☐ No ☐ Don't know

Guidance that you are aware of, if any: Enter answer here

4. Do incentive-fee, or award-fee contracts provide incentives for early completion?

☐ Yes ☐ No ☐ Don't know

5. May I contact you with any short follow-up questions or clarifications?

☐ Yes

Preferred contact:
☐ Email
☐ Phone

Preferred Time: ☐ Morning ☐ Afternoon

☐ No

You are finished
Thank you for your Time

Your survey is complete. Thank you very much for your time. Your input is vital to the success of this research!

Appendix C: Survey Data

Question	1			2	3			3a			
Answer	*Y*	*N*	*D/K*	*1-10*	*Y*	*N*	*D/K*	*NE*	*SE*	*E*	*VE*
Answer specific totals	49	64	3	749	10	105	3	1	7	1	1
Total responses per question	116			*Average*	118			10			
Percentage of answer	42.241%	55.2%	2.6%	6.35	8.5%	89.0%	2.5%	10.0%	70.0%	10.0%	10.0%

Question	4			4a			4b			5		
Answer	*Y*	*N*	*D/K*	*Y*	*N*	*D/K*	*Y*	*N*	*D/K*	*Y*	*N*	*D/K*
Answer specific totals	12	53	48	3	4	5	12	26	38	10	76	30
Total responses per question	113			12			76			116		
Percentage of answer	10.6%	46.9%	42.5%	25.0%	33.3%	41.7%	15.8%	34.2%	50.0%	8.6%	65.5%	25.9%

Question	6			7			8			9	
Answer	*Y*	*N*	*D/K*	*Y*	*N*	*D/K*	*Y*	*N*	*D/K*	*Y*	*N*
Answer specific totals	28	24	62	14	78	23	44	22	49	83	33
Total responses per question	114			115			115			116	
Percentage of answer	24.6%	21.1%	54.4%	12.2%	67.8%	20.0%	38.3%	19.1%	42.6%	71.6%	28.4%

Question #5 Comments, Units Who Use Schedule Incentives
F-16 Systems group contracting division
Mobility System Wing
Ogden ALC
Other Wings and organizations that AAC/PK supports
Predator
Predator
SMSG/TQ
US Dept of Energy, Environmental Management Consolidated Business Center Cincinatti OH
Used in ESC/SR

Question #6 Comments, Roadblocks
Availability of additional funds, and additional oversight.
Beating schedule is not the most critical area of importance in my office. On-time is good - no need to pay more for a quicker delivery.
Best have excellent accurate contract administration and program management to support government position when schedule problems occur - contractor will try to make the problem appear to be a government caused delay or etc.
Cashflow
Cointractor Reluctance
Consensus on criteria by interested parties, i.e., PM, contractor.
Funding contraints; Milestone Decision authority approval; Acquisition Plan would require unique work and approvals; No guarantee of success! Contractor may imply Government drove the tardiness in the schedule.
I am assuming that it would take additional resources to track the contractor's deliveries/performance to determine whether they have earned incentives. There are no additional resources in my organization (Centralized Conacting) to support the use of such incentives, nor could we rely on our customers to accurately track and report deliveries or performance.
I believe the contractor would extend the schedule in order to "beat" the schedule so they would receive the incentive.
It is best not to mix incentives. Ie., There should be no mixture of cost incentives and schedule incentives. It should be an "either/or" situation.
Lack of Experience/Opportunity; we use primarily FFP, even for development, and some commercial
Late GFE/GFI
No needs identified where schedule incentives would be beneficial to the Government.
To the best of my knowledge the Regs don't provide for schedule incentives.
One contract I've worked with had the contracto build-in slack th their delivery schedul so that they were always ahead of schedule. The would not sign up for a schedul which did not have this slack. The were always touted for performning ahead of schedule
R&D Contracting is too unpredictable and there are no guarantees that any scientific breakthroughs will be found - thus it is hard to meet schedules
R&D Tyoes if effort do not lend themselves to the use of schedule incentives
Requires appropriate coordination with cost control incentives or provisions to avoid conflict
Risk due to timely availability of GFP -- if GFP isn't available when it's scheduled, Gov't is responsible of slowing the schedule.
Schedule incentives have been used with cost incentives which tend to work against each other. Contractors do trade-off analyses.
Since I work Service contracts schedule is rarely an issue. Incentive contracts generally take a lot of admin time so I would not generally use - no time.
Smaller companies might not be able to participate in schedule incentive contracts as they might not have the personnel to accelerate
The nature of Advisory and Assistance Services renders schedule to be no relevant since we buy services mainly for 12 months.
The only roadblocks are the type of requirements we are buying. Examples such as FFRDC and some A&AS. Most A&AS are T&M or Labor Hr best effort contracts and thus there is no schedule incentive available.
They are difficult to negociate
Uncertainty as to how to specifically structure the incentive to reflect the incentive for schedule only. Seems it always somehow remains tied to cost.
Unforeseen performance issues
Would need to be careful that schedule didn't become the only important thing in performance. Quality and cost are also very important.

Question #7 Comments, Guidence For Schedule Incentive Implementation
AF & AFMC Incentive Handbooks
AF award term / incentive options guid
AFMC Award Fee Guide
AFMC Guide books
Check with DOE
DFARS, AFFARS, & AFMC FAR Sup. In addition AFMC Guide Books
FAR
FAR & DFARS
FAR 16.402-3 and Suppliments; Award Fee/Award Term Guid; DOD and other instructions (describe specific instructions for incentive contracts related to profession, such as researve components.
FAR 32.1000 Performance Based Paymts
FAR, Local Policy
I do not use them so I have not researched them. I suspect guidance could be found at all the usual contracting web sites
I left my answer in #2 blank right now I'm doing contract closeout and I'm not currently "managing" any contracts
I received training at the ASC New Employee Training session. I work Operational contracting, schedule incentive is adaptable to systems contracting.
I would expect there to be guidance available and would look for it if I had the opportunity
I'd check FAST book, ASC & AFMC home pages via the AFPortal; or try Google! And call ASC/PK committee
I've only see the award fee guide, Nothing on incentive fee or schedule incentive
The award fee guides give some information about incentives that can be helpful, not much in FAR or other guidance.
There is a lack of it
Wouldn't no be the same as "don't Know" for this question? The answer for #8 is "it depends " a contract would contain incentives for early completion ais those incentives are built in at the time of writing the contract.

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REPORT DOCUMENTATION PAGE	Form Approved OMB No. 0704-0188

PLEASE DO NOT RETURN YOUR FORM TO THE ABOVE ADDRESS.

1. REPORT DATE (DD-MM-YYYY)	2. REPORT TYPE	3. DATES COVERED (From - To)
13062006	Masters Thesis	

4. TITLE AND SUBTITLE
Use and Effectiveness Of Contract Schedule Incentives In Air Force Materiel Command

5a. CONTRACT NUMBER

5b. GRANT NUMBER

5c. PROGRAM ELEMENT NUMBER

6. AUTHOR(S)
Captain Rodrick Aaron Koch

5d. PROJECT NUMBER

5e. TASK NUMBER

5f. WORK UNIT NUMBER

7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)
Air Force Institute of Technology, Graduate School of Engineering and Management (AFIT/EN)
2950 Hobson Way
WPAFB OH 45433-7765

8. PERFORMING ORGANIZATION REPORT NUMBER
AFIT/GRD/ENV/06J-02

9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)
HQ AFMC/PK
4375 Chidlaw Road, Room S208
Wright-Patterson AFB OH 45433-5006

10. SPONSOR/MONITOR'S ACRONYM(S)

11. SPONSOR/MONITOR'S REPORT NUMBER(S)

12. DISTRIBUTION/AVAILABILITY STATEMENT
A

13. SUPPLEMENTARY NOTES
Masters Thesis

14. ABSTRACT

Are contract schedule incentives utilized by our acquisition contracting workforce, and if so what are their effectiveness? This research shows there is not widespread use of these types of incentives. There is also disagreement on their perceived effectiveness. Surveying, via email, the population of contracting officers and buyers within Air Force Materiel Command yielded responses from every center and many large acquisition systems. Only 8.5% of responses showed that they use schedule incentives. These respondents claim that schedule incentives are somewhat effective, yet of the 91.5% that have not used them, 2-to-1 say they would not be effective. The population named a number of roadblocks as well as a number of documents providing guidance for their implementation. Common incentive and award-fees, though not by definition schedule incentives, were perceived to shorten schedule length. By analyzing the responses as a whole, there seems to be a general lack of understanding concerning the definition, use, and implementation of schedule incentives within this population. The conclusion points to the need for education on the topic of schedule incentives.

15. SUBJECT TERMS
Schedule, Acquisitions, Contract Schedule Incentives, Cycle Time Reduction, LEAN, Contract Length

16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT	18. NUMBER OF PAGES	19a. NAME OF RESPONSIBLE PERSON
a. REPORT	b. ABSTRACT	c. THIS PAGE			Dr. Dennis D. Strouble
U	U	U	UU	51	19b. TELEPHONE NUMBER (Include area code) (937)255-3355 ext 3323